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BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 20554

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JUL 29 1993

In the Matter of )  
)

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

## SUMMARY

Southwestern Bell Mobile Systems, Inc. ("SBMS") replies to various comments filed in the instant proceeding and provides additional support for the adoption of final rules for the allocation of spectrum to the new Location and Monitoring Service ("LMS") consistent with its previous Comments. These reply comments focus primarily on the proposed allocation of wide-band LMS systems.

SBMS supports permanent rules for operation of automatic vehicle monitoring systems in the 902-928 MHz band and creation of the LMS. Permanent LMS rules should encourage competition and innovation while minimizing potential electrical interference among carriers.

SBMS intends to introduce an exciting new LMS technology to the United States called Quiktrak. The Quiktrak LMS system is designed to operate in shared spectrum and employs technology requiring only one-fourth the bandwidth currently set aside by the FCC for existing wide-band LMS systems with no loss of performance.

Because of Quiktrak's unique characteristics, SBMS believes that sharing is immediately feasible in the LMS bands not only with Part 15 and other co-band users but also with other LMS licensees. As an example, SBMS demonstrates how it specifically designed a proposed wide-band LMS system in Chicago, Illinois to share spectrum with an existing wide-band licensee. SBMS is committed to provide the Commission with data proving the ability of the two systems to exist simultaneously in shared spectrum.

Because sharing is immediately feasible, SBMS submits that the Commission should not protect existing wide-band LMS licensees. Indeed such a policy would undermine the Commission's public interest objectives by (1) installing two incumbent licensees as the LMS industry standard, notwithstanding the unconstructed status

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BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of	)	PR Docket No. 93-61
the Commission's Rules	)	RM-8013
to Adopt Regulations for	)	
Automatic Vehicle	)	
Monitoring Systems	)	

REPLY COMMENTS OF SOUTHWESTERN BELL MOBILE SYSTEMS, INC.

Southwestern Bell Mobile Systems, Inc. ("SBMS") by its attorneys and in accordance with Section 1.415(c) of the Commission's Rules, 47 C.F.R. §1.415(c) (1981), hereby submits these reply comments in the above-captioned proceeding.

I- INTRODUCTION

SBMS supports permanent rules for operation of Automatic Vehicle Monitoring ("AVM") systems in the 902-928 MHz band to expand licensee eligibility and permissible uses of the spectrum, while creating a fair and efficient channelization plan for the new Location and Monitoring Service ("LMS").<sup>1/</sup> Permanent LMS rules should encourage competition and innovation while minimizing potential electrical interference among carriers.

SBMS intends to introduce an exciting new LMS technology to the United States called Quiktrak. The Quiktrak LMS system is designed to operate in shared spectrum, and employs technology requiring only one-fourth the bandwidth currently allocated (on a

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<sup>1/</sup> For the purpose of consistency, SBMS will refer to both AVM and LMS services as "LMS" throughout these reply comments.

non-exclusive basis) to existing wide-band LMS systems with no loss of performance. Because of Quiktrak's unique characteristics, SBMS can confidently state that LMS band sharing is immediately feasible.<sup>2/</sup>

In its Comments, SBMS presented two alternative proposals for LMS spectrum.<sup>3/</sup> Both proposals incorporated the Commission's plan to relocate narrow-band LMS systems to discrete spectrum. SBMS Comments at 11. Both proposals also provided for licensing of multiple wide-band LMS providers by allocating at least four exclusive 4 MHz wide-band assignments in each market area. *Id.* at 13. Under SBMS' preferred proposal, 250 kHz forward links will be allocated in spectrum outside each exclusive 4 MHz assignment. Under its alternative scheme, forward links will be located within each exclusive wide-band assignment to afford some protection from and control of harmful interference. *Id.* at 16.

Review of comments filed by over 80 parties in this proceeding confirm the public interest benefits of implementing SBMS' preferred allocation proposal. Considering the competing interests and considerations presented by various commenters, the compromise

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<sup>2/</sup> See Comments of SBMS, filed June 29, 1993, at 16 (hereinafter "SBMS Comments").

<sup>3/</sup> The two SBMS proposals are appended hereto as Exhibit 1.

SBMS urges the Commission to reject set-asides or waiting periods which will preclude or defer new carrier entry -- thus producing an economic windfall for incumbents and encouraging spectrum warehousing. North American Teletrac and Location Technologies, Inc. ("Teletrac") and MobileVision, L.P. ("MobileVision") apparently planned their systems assuming they would have an exclusive allocation of LMS spectrum -- an erroneous view of the Commission's original interim LMS policies. These entities now seek exclusive allocations of two eight MHz LMS licenses per market and a freeze on future LMS licensing, knowing full well that such policies will dramatically enhance the economic value of their authorizations while eliminating the incentive for



II- FREQUENCY SHARING IS IMMEDIATELY FEASIBLE IN THE LMS BAND

As shown below, and contrary to assertions found in initial comments of certain parties to this proceeding, frequency sharing

degradation to either party.

These claims presume implementation of Quiktrak<sup>9/</sup>-- the system SBMS intends installing in any market where it is licensed to provide LMS-- or an equally robust technology. Quiktrak's attributes are explained below and in attached testimony from engineering experts responsible for developing, deploying and evaluating the Quiktrak system.<sup>10/</sup>

A. Quiktrak Technology Facilitates Sharing  
In A Spectrum Scarce Environment

SBMS has been striving, since early 1992, to implement shared-spectrum LMS systems in the United States. Unlike Teletrac and MobileVision, SBMS firmly believes that wide-band pulse ranging spread spectrum LMS systems can share spectrum assuming reasonable equality of signal power. Quiktrak technology facilitates spectrum sharing and can co-exist with systems like those advocated by Teletrac and MobileVision, which operate at comparable power levels.<sup>11/</sup>

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<sup>9/</sup> A commercial Quiktrak system is presently operating in Sydney, Australia in the 400 MHz band. All rights to Quiktrak technology are held by British Aerospace Australia Limited ("BAeA"), which appointed Electronic & Space Corporation ("E&S") as licensor of Quiktrak technology in North America. E&S agreed to supply transmission equipment, mobile units, software and training for Quiktrak systems deployed by SBMS.

<sup>10/</sup> The SBMS expert testimony is attached hereto as Exhibits 2 through 6.

<sup>11/</sup> A system whose forward links radiate significantly higher power, like that proposed by Pinpoint Communications, Inc. ("Pinpoint"), will degrade the accuracy and coverage of lower-powered LMS systems with which it shares the spread spectrum band. Accordingly, a Pinpoint system is incompatible with sharing. See

The adaptability of Quiktrak to spectrum sharing is addressed in the attached Declaration of Joseph E. Fleagle, an engineer with the E&S subsidiary that is collaborating with BAeA in developing the Quiktrak system in Sydney, Australia. Mr. Fleagle testifies that spectrum sharing between multiple LMS systems is "both feasible and practical" provided that: 1) high power, fixed site forward link signals are sufficiently frequency-separated from the wide-band mobile return to permit excising the forward link from receivers used to detect mobile emissions<sup>12/</sup>; and 2) signals emitted from mobiles of all competing LMS providers are limited to approximately the same ERP.<sup>13/</sup> As further evidence that sharing can be implemented immediately, Mr. Fleagle notes that:

- the number of mobiles transmitting simultaneously at any instant in time will be relatively small and their respective emissions will be of short duration; and
- the average noise power from mobile transmissions at any one receiver of a competing system is small; at most, one remote receiving site will be affected.<sup>14/</sup>

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service experienced by Part 15 users will deteriorate in areas near Pinpoint's fixed transmitter sites.

<sup>12/</sup> This condition is an important element of SBMS' preferred allocation proposal which calls for assigning wide-band system forward links to spectrum at the LMS band edges.

<sup>13/</sup> Declaration of Joseph E. Fleagle, Exhibit 2 hereto, at 2.

<sup>14/</sup> Id. at 2-3.

Spectrum sharing's efficacy is enhanced when competing LMS operators engage in limited technical coordination. Mr. Fleagle testifies that "some coordination" between rival LMS operators can achieve low cross correlation with respect to certain technical parameters, thereby allowing discrimination among transmissions of competing systems.<sup>15/</sup> In sum, provided the referenced conditions are satisfied and competing operators undertake some coordination (as SBMS has, in fact, done in Chicago<sup>16/</sup>), spectrum sharing is an immediate option for LMS licensing policy.

Quiktrak's spectrum sharing technology is predicated on a modest and prudent allocation of spectrum. Specifically, the technology is designed to operate with only a two MHz block, although SBMS endorses separate allocations of four MHz each in the 904-912 and 918-926 MHz bands to avoid disruption to the four MHz systems espoused by Teletrac and MobileVision.<sup>17/</sup> The technical rationale for a two MHz allocation is expressed in the attached Declaration of Gregory C. Hurst, an engineer with BAeA and a co-inventor and developer of Quiktrak technology.

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<sup>15/</sup> Id. at 3-4.

<sup>16/</sup> See Declaration of Joseph E. Fleagle, Exhibit 2 at 4, and Affidavit of Keith Rainer, Exhibit 5 at 2-3.

<sup>17/</sup> SBMS itself intends to adapt its operations to this four MHz allocation. Existing LMS licensees MobileVision and Teletrac admit that they use only four MHz of their eight MHz allocations. See Comments of MobileVision, L.P. at 37 (in which it explains that its system generates a primary lobe of 4 MHz), see also, Response of Teletrac to the Comments of the Missile Group Old Crows (hereinafter "Old Crows Response"), RM No. 8013 (filed Jan. 14, 1993) at 12.

In his Declaration, Mr. Hurst notes that the ability to maximize system location capacity by utilizing maximum bandwidth is limited by the characteristics of the operating environment.<sup>18/</sup> By maximizing "process gain," the interference and noise immunity of system receivers are maximized while infrastructure costs are minimized. At 900 MHz, coherence bandwidths of little more than one MHz are customary for open suburban regions while substantially smaller bandwidths can be found in the business districts of modern cities.<sup>19/</sup> Quiktrak technology:

recognises this reality in using a 1 MHz clock to drive the spreading code, resulting in a null-to-null bandwidth of 2 MHz and a -3 dB bandwidth of approximately 1 MHz. This is the realistic maximum bandwidth that can be usefully employed in the LMS environment. In fact the whole of this bandwidth is not usefully utilised when the mobile is located in the most cluttered urban environments . . .<sup>20/</sup>

In sharp contrast to Mr. Hurst's above-cited testimony, Teletrac advocates assigning eight MHz to a single user, claiming that a doubling of system bandwidth produces a quadrupling of system location capacity. As discussed in an analytical paper attached hereto,<sup>21/</sup> the purported causal relationship between system bandwidth and location capacity "implicitly assumes that

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<sup>18/</sup> Declaration of Gregory C. Hurst, Exhibit 3 hereto at 2-3.

<sup>19/</sup> Id. at 3.

<sup>20/</sup> Id. (emphasis added).

<sup>21/</sup> See "Remarks On Comments Made By North American Teletrac And Location Technologies, Inc. (Teletrac) and Pinpoint Communications, Inc. (Pinpoint) To FCC NPRM Docket 93-61" (hereinafter "Remarks") by Gregory C. Hurst, Michael John Yerbury and Joseph E. Fleagle, attached hereto as Exhibit 4.

signal coherence is maintained over the whole of the occupied bandwidth," a dubious assumption for terrestrial LMS systems that "almost always operate in cluttered environments where radio propagation from mobile transmitters to base receivers is multipath in character and rarely line-of-sight."<sup>22/</sup>

By failing to account for "coherence bandwidth," Teletrac is advocating an intrinsically flawed proposal. As stated in the Remarks:

As a consequence of the need for coherence, little or no benefit accrues from increasing system bandwidth beyond about 2 MHz because the additional frequency components add incoherently in a scattering environment. Hence a system using a contiguous 8 MHz band would have no greater capacity than one using a 2 MHz sub-band, all other parameters being equal - but four such 2 MHz systems could be accommodated in the 8 MHz band and supply four times the capacity.

Remarks, Exhibit 4 hereto at 3.

B. Spectrum Sharing Can Protect Incumbent Licensees

While realizing the benefits of free market competition and deterring warehousing, sharing in the 904-912 and 918-926 MHz bands can be implemented immediately without impairing existing licensees or systems-- as illustrated by SBMS' proposed Quiktrak system for Chicago where MobileVision is an existing licensee.<sup>23/</sup> SBMS intentionally chose technology specifically designed for Chicago and other markets "to minimize the spillage of energy into the

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<sup>22/</sup> Remarks, Exhibit 4 at 2.

<sup>23/</sup> SBMS filed an application to construct and operate an LMS system in the 918-926 MHz band in Chicago, Illinois in December 1992. (See File No. 346790.) On February 17, 1993, MobileVision filed a Petition to Deny the SBMS application.

MobileVision center frequency range," anticipating that any residual sideband energy will be buried in the noise from Part 15 and other users.<sup>24/</sup>

Specifically, the carrier frequency for the SBMS system is 919 MHz and the output signal has a null-to-null bandwidth of 2 MHz. As a result, the main lobe of the SBMS wide-band signal is positioned over the first side-lobe of MobileVision's wide-band signal, which is centered on 922 MHz. Less than one-half of one per cent of the power transmitted in the wide-band signal of a transponder operating on the SBMS system will occur in the operating bandwidth of the wide-band portion of MobileVision's system.<sup>25/</sup> Thus, by design, out of band energy in the SBMS system is significantly attenuated, and potential interference involving mobile units of other systems is significantly reduced and should be exceedingly rare.

C. Shared LMS Systems Can Co-exist With  
Part 15 And Other Co-Band Users

The Quiktrak system is designed to coexist with other 902-928 MHz licensees-- i.e., Federal Government, ISM and Part 15 devices-- as well as other wide-band LMS systems. The licensing scheme advocated here by SBMS will thus have, at worst, a trivial impact on Part 15 users who typically operate devices with less than one watt ERP, that are generally located indoors, and that are

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<sup>24/</sup> Declaration of Joseph E. Fleagle, Exhibit 2 at 4; see also, Affidavit of Keith Rainer, Exhibit 5 at 2-3.

<sup>25/</sup> Affidavit of Keith Rainer, Exhibit 5 at 3.

geographically dispersed. Accordingly, the characterization of this proceeding as a "public policy disaster"<sup>26/</sup> should be regarded by the Commission as the unvarnished and unsubstantiated hyperbole that it is. Even such Part 15 devices as wireless LANs-- which may utilize frequencies in the LMS bands, and have fixed locations close to LMS receivers and thereby achieve a range advantage over LMS system mobiles-- have elicited no serious reservations about mutual co-existence other than a passing acknowledgement from Teletrac that their emissions may present an occasional problem.<sup>27/</sup>

**III- PROTECTING EXISTING LICENSEES FROM COMPETITIVE ENTRY WILL UNDERMINE THE COMMISSION'S STATED POLICY OBJECTIVES FOR LMS**

Two alternate methods for licensing wide-band pulse ranging LMS systems in the 904-912 and 918-926 MHz bands are set forth in the NPRM. Under the first, wide-band LMS licenses will be issued on a non-exclusive basis, assuming spectrum sharing is "immediately feasible;" under the second, the Commission will continue to license systems in the subject bands, but new applicants will be located at least 110 miles from all previously licensed co-channel

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<sup>26/</sup> See Comments of Part 15 Coalition at iii.

<sup>27/</sup> Proliferation of LMS systems and Part 15 devices will eventually increase noise power within LMS bands so as to potentially jeopardize viability of a particular system. Declaration of Joseph E. Fleagle, Exhibit 2 at 3. Accordingly, the Commission should adopt SBMS' proposal in Section IV below to assign 4 MHz of spectrum to four separate carriers thereby limiting the number of LMS operators in a particular segment of the 904-912 and 918-926 MHz bands, and/or possibly reducing power ceilings for Part 15 devices. These measures will reduce the rate of interference buildup in the LMS bands, although they are not presently warranted.



stations for a five year period beginning with the effective date of this proceeding's Report and Order, after which no minimum mileage separation will be imposed; subsequent licensees, however, will be required to protect all previously licensed co-channel stations.<sup>28/</sup> Implementing the latter proposal will accord incumbent licensees-- principally Teletrac and MobileVision, each of which have received licenses for LMS systems in scores of markets with only limited construction of systems-- a headstart with no countervailing public interest benefit. Indeed, this proposal will undermine the Commission's public interest objectives for LMS by:

- installing the two dominant incumbents as the LMS industry standard notwithstanding the unconstructed status of most of their licensed systems and the exorbitant costs associated with their proposed technology;
- encouraging incumbents to "warehouse" their 900 MHz assignments;
- depriving the public of cost-based pricing, technological innovation and expanding consumer choice associated with markets unencumbered by spurious limits on entry; and
- precluding spectrum sharing by LMS carriers even though SBMS has demonstrated that sharing is "immediately feasible."

These serious disadvantages of the Commission's alternate licensing scheme are discussed below.

Installing Incumbents as LMS Industry Standard-- There should be no doubt that, if adopted, the NPRM's alternate licensing proposal will prove a government-given bonanza for Teletrac and

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<sup>28/</sup> NPRM, 8 FCC Rcd at 2506, para. 22.

MobileVision, incumbents holding multiple 900 MHz LMS licenses. Because the NPRM's alternate scheme provides a five-year headstart and compels subsequent entrants to protect the headstart's recipients, Teletrac and MobileVision systems will become the industry standard for wide-band LMS. Nevertheless, these two entities, by their own admission, champion high cost technology and have built, at most, only a handful of the systems for which they hold licenses (see discussion infra).

The Commission's alternate licensing scheme will only reward entities who have filed substantial numbers of applications and have also persuaded the Commission to waive the construction requirements associated with their ensuing authorizations while not offering service to the public. Why these regulatory accomplishments merit a government license insulating the holder

Encouraging Warehousing-- By arbitrarily constricting entry, the alternate licensing scheme will also eliminate any incentive for prompt construction and initiation of service by incumbents Teletrac and MobileVision. To date, MobileVision, which holds wide-band licenses for 121 separate markets, has constructed what it describes as a "test" system in a single market and nothing more. (Teletrac's ratio of systems constructed to licenses held is apparently somewhat higher.) Moreover, these entities have succeeded in influencing the Commission to waive the construction deadlines associated with their numerous licenses and there is no assurance they will refrain from seeking additional construction waivers-- especially if barriers to competitive entry are artificially imposed by the Commission.

Frequencies are "warehoused" when they are licensed to an entity that has no intention of prompt construction and operation but seeks the authorization for unrelated purposes, like blocking potential rivals and impeding competition.<sup>30/</sup> Deterring warehousing is a paramount Commission policy objective in almost every radio service. To deter warehousing here, the Commission must avoid "cartelizing" the nascent LMS industry by bestowing

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interim AVM rules, they have been consistently interpreted and applied in a manner wholly inconsistent with Teletrac's portrayal of the Commission's original intent.

<sup>30/</sup> See Mobilfone Of Northeastern Pennsylvania, Inc., 4 FCC Rcd 8737, 8738 (Mob. Svcs. Div. 1989); Amendment of Part 90 Subparts M and S of the Commission's Rules (Notice of Proposed Rulemaking in PR Docket No. 86-404), 1 FCC Rcd 809, 813 (1986); Radio Call Company, Inc., 6 FCC Rcd 351, 352 (Com. Car. Bur. 1991).

monopoly status on Teletrac and MobileVision.

Denying Benefits of Competitive Entry-- The Commission has consistently acknowledged that consumer welfare is maximized when barriers to entry are curtailed and competition is encouraged. In a market unconstrained by regulatory barriers to entry, price/quality competition spawns cost-based pricing, improved service and product quality and rapid innovation.<sup>31/</sup> The NPRM's alternate licensing scheme will deprive IMS consumers of these

availability of competitive LMS.

IV- SBMS' PROPOSAL TO ALLOCATE FOUR SEPARATE WIDE-BAND OPERATORS IN EACH MARKET AREA IS IN THE PUBLIC INTEREST

Although spectrum sharing is feasible today, SBMS' proposal to separate narrow-band and wide-band operators while allocating 4 MHz to four separate operators in each market area will serve the public interest. The SBMS proposal will reconcile the divergent positions on wide-band LMS licensing that have been expressed in this proceeding and will hasten the advent of a "competitive" environment in which LMS can develop.<sup>33/</sup> For the reasons given below, the Commission should seriously consider the SBMS proposal.

A. Multiple Exclusive Licenses Will Promote Competition.

Multiple exclusive licenses will promote competition and deter any licensee from "warehousing" its assignment. A market structure characterized by four (rather than two) licensees per service area will spur cost-based pricing, improve service and product quality and encourage technical innovation. No licensee in a four-carrier market can rely on the laxity, financial (or other) constraints or incompetence of any single rival to delay system implementation, withhold service from the public, or otherwise create an

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<sup>33/</sup> As SBMS explained in its Comments, Quiktrak's efficiencies, and other developments in LMS technology, will expand LMS band capacity and utilization (assuming the NPRM's alternate licensing scheme is rejected). Although this trend should have no adverse impact on Federal Government, ISM or Part 15 operations, there is a limit to the number of systems that can be accommodated in the 904-912 and 916-928 MHz bands. In a shared environment, even the most robust system can ultimately be overwhelmed by co-channel noise. For this reason some measure of wide-band channel exclusivity should be introduced into the LMS band.

In direct contrast to SBMS' pro-competitive view, Teletrac goes to extraordinary lengths to justify exclusive assignments of eight MHz each to two wide-band LMS carriers per market. These rationalizations presume that the exorbitant costs associated with Teletrac's systems are the inescapable norm for all LMS technology. As shown below, this assertion of fact and the conclusions derived

about \$10 million in annual cost that must be recovered if entry is to be profitable. Study at 6, 30.<sup>35/</sup>

- All wide-band LMS operators will have cost structures approximating Teletrac's. Based on this assumption and extrapolating from operating expense data for Teletrac's Los Angeles system, the Study concludes that four firms serving the same market would have "annual operating expenses that totalled about 47 percent higher than two firms providing the same amount of capacity," while eight firms would have annual operating expenses totalling about 142 percent higher than the two firm model. Study at page 29.
- That uncertainty regarding spectrum sharing will constitute an ". . . impediment to the voluntary entry of firms" into the wide-band LMS market. Study at 5.

However relevant these assumptions may be to Teletrac's experience,<sup>36/</sup> they are patently inapplicable to SBMS' Quiktrak system, as demonstrated below. As a result, implementing Teletrac's restrictive, cartel-like licensing scheme will keep from the marketplace and the public an entirely different approach to developing and deploying wide-band LMS systems from that adopted by the dominant incumbents. Candidly stated, the Study's profound irrelevance to Quiktrak underscores the need for a wide-band licensing scheme predicated on multiple operators per market.

1. SBMS Has Avoided Incurring Significant R&D Costs.

Quiktrak's R&D costs have been borne by others and are not assumed by SBMS in any of its contractual licensing arrangements.

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<sup>35/</sup> Based on this analysis, Teletrac suggests that, to achieve viability, an individual licensee must be licensed in multiple markets over which it can spread its fixed costs. Teletrac Comments at 36, note 35.

<sup>36/</sup> MobileVision revealed that it has also incurred significant R&D costs, spending more than \$40 million in developing, licensing and deploying its wide-band LMS system. MobileVision Comments at page 12.

The Study's claim (at page 30) that LMS licensees will have to recoup multi-million dollar R&D costs when providing service and that this obligation will limit the ability of multiple licensees to operate in a market on a cost-effective basis is simply inconsistent with reality for SBMS.

According to the Study's own analysis, SBMS will enjoy an annual cost advantage of approximately \$10 million vis-a-vis Teletrac simply because SBMS' R&D costs for Quiktrak are nil.<sup>37/</sup> Eschewing unproven technologies for an existing operating system, SBMS (and other potential wide-band entrants) can realize substantial operating advantages compared to the two dominant incumbent licensees-- provided the Commission adopts SBMS' pro-competitive licensing scheme.

2. Teletrac's Cost Structure Is An Inappropriate Model for SBMS.

Teletrac's assumption that all wide-band LMS providers will incur construction and operating costs comparable to its own (Study at 29-30) is as flawed as its imputation to SBMS of its own exorbitant R&D costs. That Teletrac's (and MobileVision's) reported construction expense vastly exceed the most expansive estimates of what SBMS anticipates is easily demonstrated.

Teletrac reports combined R&D and construction costs for six wide-band LMS systems of \$150 million,<sup>38/</sup> of which R&D constitutes

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<sup>37/</sup> Extrapolating from the Study's amortization methodology, SBMS will operate at approximately a \$6.6 million annual cost advantage over MobileVision, which must recoup \$40 million in R&D costs.

<sup>38/</sup> Teletrac Comments at 7.



\$60 million.<sup>39/</sup> Allocating the \$90 million construction cost figure over six systems yields average system construction costs of \$15 million. Although MobileVision has yet to construct an operating commercial system, it was stated in court papers that MobileVision will spend \$26 million to construct a Chicago LMS system.<sup>40/</sup>

Compared to SBMS, Teletrac's and MobileVision's construction costs are plainly excessive. For its proposed wide-band system in Chicago-- for which an application proposing seven transmitters, which is substantially more infrastructure than MobileVision (who is licensed for three transmitter sites) will build, is presently pending-- SBMS has firm contractual commitments from its vendor to provide all equipment, software, installation and training necessary to produce a fully operational system for a total cost slightly exceeding six million dollars. The huge disparity between this figure and comparable cost data reported by Teletrac and MobileVision boldly demonstrates that there is no basis for assuming that SBMS and other potential entrants will have cost structures even faintly resembling those of the dominant incumbents. Accordingly, the Study errs by endorsing this

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<sup>39/</sup> Study at 30.

<sup>40/</sup> Specifically, it is alleged in an Amended Complaint of Ameritech Mobile Data, Inc. ("AMD") et al. filed in the United States District Court For the Northern District of Illinois, Eastern Division that "AMD's capital contributions are limited by the Partnership Agreement to an aggregate of \$9 million in 1991 and \$17 million in 1992 for a total of \$26 million for the Chicago network." Amended Complaint, U.S. Dist. Ct., N.D. Ill., Case No. 93C-1261, at 4, para. 13.